KDL®

Single-use Containers for


# HUMAN VENOUS BLOOD SPECIMEN COLLECTION

**SHANGHAI KINDLY(KDL) GROUP**
NANCHANG KINDLY MEDICAL TECHNOLOGY CO.,LTD

Specimen type and preparation method:

| Lid Color | Clinic Application | Specimen Type | Steps of Specimen Preparation | Additive |
|---|---|---|---|---|
| | Biochemical test, blood bank test | Blood serum | After blood collection, you don't need to invert and mix, let it stand for 1 hour and centrifuge | Nothing |
| | Serum test | Blood serum | Recommended minimum time is 15-30 minutes 1500~2200g(RCF)for 10 minutes at18-25°C | Coagulant |
| | PCR check | Blood plasma | Immediately after blood collection invert and mix 8 -10 times, centrifuge | Separation gel /EDTA.K2 |
| | Blood conventional check, full blood test | Whole blood | Immediately after blood collection, invert and mix 8-10 times, mix sample before test | EDTA.K2 or EDTA.K3 |
| | Quick biochemical test of blood, serum biochemical test | Blood serum | Recommended coagulation time is 15-30 minutes 1500~2200g(RCF)for 10 minutes at 18-25°C | Clot Activator & Gel |
| | Quick biochemical test of blood plasma, hemorrheology test | Blood plasma | Immediately after blood collection. invert and mix 8-10 times, centrifuge | Heparin sodium or heparin lithium |
| | Test of blood solidification, PT/APTT, test of solidification blood gene | Blood plasma | Immediately after blood collection. invert and mix 8 times,centrifuge | Na-Citrate:3.2% blood sample=1:9 |
| | Blood sugar test | Blood plasma | Immediately after blood collection. invert and mix 8-10 times,centrifuge ≤1300g(RCF) for 10 minutes at 18-25°C | Sodium Fluoride Sodium Heparin |
| | Erythrocyte sediment rate test | Whole blood | Gently inverted 180in 8-10 times | Na-Citrate:3.8% blood sample=1:4 |
| | Blood bank research, HLA typing, DNA paternity testing and other research | Whole blood | Gently mixed 180 degrees upside down for 8-10 times ≤1300g(RCF) for 10 minutes at 25°C | Anti-coagulant ACD(Acid Citrate Dextrose) |
| | Separation of undiluted plasma,molecular diagnostic test | Blood plasma | Immediately after blood collection, gently reverse blood vessel mixing 5-10 times | K2 EDTA & Gel |
| | Quick biochemical test of blood plasma,biochemical test | Blood plasma | Immediately after blood collection. invert and mix 8-10 times,centrifuge 1500-2000g(RCF) for 10 minutes at 18-25°C | Lithium Heparin & Gel |

## KDL Serum Tubes

KDL serum tubes could produce(no additive) high quality serum, it doesn't contain clot activator with a gel barrier.

Specification: No Additive.

Cap Colour: Red & White.

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6656 | 3ml | 13x75 | Glass |
| 6657 | 5ml | 13x100 | Glass |
| 6658 | 6ml | 13x100 | Glass |
| 6001 | 2ml | 13x75 | PET |
| 6002 | 3ml | 13x75 | PET |
| 6005 | 5ml | 13x100 | PET |
| 6006 | 6ml | 13x100 | PET |

### Clotting times:

The recommended minimum coagulation time for serum tubes from patients who have not been treated with anticoagulant therapy is 60 minutes


## KDL Serum Tubes

To obtain serum samples from plastic tubes, coagulation activator needs to be added in the tube, since the plastic surface alone is insufficient to activate the blood coagulation within certain time, KDL plastic serum tubes are processed with silicon on the inner surface, which will accelerate the coagulation.

Specification: Serum with clot activator(silicaparticles)

Cap Colour: Red & Orange

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6014 | 3ml | 13x75 | PET |
| 6018 | 5ml | 13x100 | PET |
| 6019 | 6ml | 13x100 | PET |
| 6662 | 3ml | 13x75 | Glass |
| 6664 | 5ml | 13x100 | Glass |
| 6665 | 6ml | 13x100 | Glass |

### Clotting times:

The recommended minimum time for the coagulation of serum tubes from patients who have not been treated with anticoagulants is 15-30 minutes

### Centrifuging conditions:

1500~2200g(RCF) for 10 minutes at18-25°


## KDL K2 & K3 EDTA Tubes

EDTA salts (ethylenediamine tetracetic acid) are used in hematological studies to anticoagulate whole blood because the cellular components of blood could be well preserved by EDTA particularly. It is an anticoagulant because it forms a complex with metal ions such as calcium that inhibits the clotting cascade.

EDTA anticoagulation is irreversible.When filling levels are correct, the concentration of EDTA in KDL tubes is 1.8mg/ml of whole blood, as recommended by the ICSH (International Council of Heamatological Societies). The ICSH recommends the use of EDTA dipotassium (K2EDTA) for hematological examination. KDL plastic tubes are available with spray drying K2EDTA andK3EDTA*

Specification: K2 EDTA

Cap Colour: Purple

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6049 | 2ml | 13x75 | PET |
| 6051 | 3ml | 13x75 | PET |
| 6053 | 4ml | 13x75 | PET |
| 6055 | 5ml | 13x100 | PET |
| 6057 | 6ml | 13x100 | PET |
| 6676 | 2ml | 13x75 | Glass |
| 6677 | 3ml | 13x75 | Glass |
| 6678 | 4ml | 13x75 | Glass |
| 6679 | 5ml | 13x100 | Glass |
| 6680 | 6ml | 13x100 | Glass |

Specification: K3 EDTA

Cap Colour: Purple

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6066 | 2ml | 13x75 | PET |
| 6068 | 3ml | 13x75 | PET |
| 6072 | 5ml | 13x100 | PET |
| 6683 | 2ml | 13x75 | Glass |
| 6684 | 3ml | 13x75 | Glass |
| 6685 | 5ml | 13x100 | Glass |

*International Council for Standardization in Haematology and Expert Panel on Cytometry,Recommendations of the International Council for the Standardiza _x0002_ tion in Haematology for Ethylenediaminetetraacetic Acid Anticoagulation of Blood for Blood Cell Counting and Sizing.Am J Clin Patholo 1993;100: 371-372.


### Tube mixing:

Correct mixing(8-10 inversions)of EDTA tubes immediately after blood collection is very important to avoid blood micro coagulation effectively.

## KDL Advance tubes with Gel & Clot Activator

An inert gel is added in KDL advanced gel & clot activator tubes.The gel could separate the serum and the blood clot, which prevents the contamination of the serum from the separated cellular components during centrifugation.

For example, the serum for certain analytes such as potassium,phosphorus and glucose must be separated from the cells within a few hours -otherwise the results will be distorted considerably. Using KDL Advance tubes in routine clinical chemistry, the analytes such as potassium and glucose are still stable after a week of storage at 2-8°C.

Specification: Clot Activator & Gel

Cap Colour: Yellow

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6026 | 3ml | 13x75 | PET |
| 6028 | 4ml | 13x100 | PET |
| 6029 | 5ml | 13x100 | PET |
| 6668 | 3ml | 13x75 | Glass |
| 6669 | 4ml | 13x100 | Glass |
| 6670 | 5ml | 13x100 | Glass |

### The main advantages of gel tubes:

•The barrier between serum and clotting is stable, therefore the analyte is more stable, the sample quality is better.

•Optimized workflow;Short centrifugation time, sample processing and archiving in the primary tube.

•Eliminate the possibility of misidentification due to the use of secondary tubes.

### Clotting times:

The recommended coagulation time is15-30 minutes.


### Centrifuging conditions:

1500~2200g(RCF) for 10 minutes at 18-25°C

## KDL Plasma Tubes

KDL plasma tubes are available with spray-dried sodium heparin or lithium heparin additives, these tubes can be used for clinical chemistry analysis.The heparin works as anticoagulant by developing an antithrombin complex,which inhibits thrombin and the activated factor X and thus prevents coagulation.

KDL plasma tubes with lithium heparin is spray dried on the surface of tube inner walls by special procedure, so that the additive is evenly distributed to achieve the best possible solubility.For clinical chemistry, lithium heparin is generally preferred over sodium heparin.

Specification: Sodium Heparin

Cap Colour: Green

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6102 | 3ml | 13x75 | PET |
| 6104 | 4ml | 13x75 | PET |
| 6106 | 5ml | 13x100 | PET |
| 6108 | 6ml | 13x100 | PET |
| 6696 | 3ml | 13x75 | Glass |
| 6697 | 4ml | 13x75 | Glass |
| 6698 | 5ml | 13x100 | Glass |
| 6699 | 6ml | 13x100 | Glass |

Specification: Lithium Heparin

Cap Colour: Green

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6122 | 3ml | 13x75 | PET |
| 6124 | 4ml | 13x75 | PET |
| 6126 | 5ml | 13x100 | PET |
| 6128 | 6ml | 13x100 | PET |
| 6702 | 3ml | 13x75 | Glass |
| 6703 | 4ml | 13x75 | Glass |
| 6704 | 5ml | 13x100 | Glass |
| 6705 | 6ml | 13x100 | Glass |


### Tube mixing:

KDL heparin tubes should be mixed correctly(8-10 times inversions)and immediately after the blood sample has been taken, this is extremely important to avoid micro-clotting

## KDL Plasma Tubes

KDL plasma tubes with separating gel for clinical chemistry are available with spray-dried lithium heparin additives. An inert gel could separate the serum and the blood clot preventing the contamination of the plasma from the separated cellular components during the centrifugation of the KDL Lithium Heparin & Gel tubes. The plasma for certain analytes such as potassium, phosphorus and glucose must be separated from the cells within a few hours, or else, the results will be significantly distorted. Using KDL Lithium Heparin & Gel tubes in clinical chemistry routine analytes, such as potassium and glucose are still stable after a week of storage at 2-8°C

Specification: Lithium Heparin & Gel

Cap Colour: Light Green

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6177 | 3ml | 13x75 | PET |
| 6179 | 4ml | 13x100 | PET |
| 6181 | 5ml | 13x100 | PET |

### The main advantages of gel tubes:

•The barrier between plasma and clotting is stable, therefore the analyte is more stable, the sample quality is better.

•Optimized workflow;Short centrifugation time, sample processing and archiving in the primary tube.

•Eliminate the possibility of misidentification due to the use of secondary tubes.

### Effects of temperature:

KDL Lithium Heparin Gel tubes should be stored at 4-25°C and protected from direct sunlight during storage.Under centrifugation or low temperature conditions, the fluidity of the blood sample in the tube is reduced, The optimum temperature for separation of sediment and plasma is 20-25°C.


### Tube mixing:

KDL Plasma tubes with separating gel should be mixed correctly (8-10 times inversions) andimmediately after the blood sample has been taken, which avoids micro-clotting

### Centrifuging conditions:

1500-2000g(RCF) for 10 minutes at 18-25°C

## KDL Coagulation Tubes

KDL coagulation tubes contain a buffered sodium citrate solution and are used for examination of coagulation parameters, The tubes are available with a citrate concentration of 3.2%

The mixing ratio is 1 part citrate solution to 9 parts blood.Correct amount of blood collection is critical for correct coagulation analysis.

Specification: 3.2% Sodium Citrate

Cap Colour: Blue

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6082 | 2ml | 13x75 | PET/PP |
| 6083 | 3ml | 13x75 | PET/PP |
| 6688 | 2ml | 13x75 | Glass |
| 6689 | 3ml | 13x75 | Glass |

### Coagulation conditions:

- Platelet-rich plasma: 1500-2000g(RCF) for 5 minutes at 18-25°C
- Platelet-poor plasma: Plastic tubes: 2000-2500g(RCF) for 10-15 minutes at 18-25°C
- Platelet-free plasma:> 3000g(RCF) for 15-30 minutes at 18-25°C

KDL recommends that glass tubes are not centrifuged at more than 2200g(RCF) in a swing-out rotor (for fixed angle rotor not more than 1300g(RCF))

### Tube mixing:

Immediately after blood collection.invert and mix 8 times, centrifuge


## KDL Plasma Tubes

KDL blood glucose analysis tubes can be used for clinical glucose analysis by adding sodium fluoride, heparin sodium, K2 EDTA and potassium oxalate. Glucose values of unpreserved blood samples drop rapidly after collection because glucose is metabolized by blood cells. The additive(sodium fluoride or sodium heparin) contained in the KDL blood glucosetube can stop enzymatic activity in the glycolytic pathway.

Specification: Sodium Fluoride
Sodium Heparin

Cap Colour: Gray

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6038 | 2ml | 13x75 | PET |
| 6040 | 3ml | 13x75 | PET |
| 6042 | 4ml | 13x100 | PET |
| 6044 | 5ml | 13x100 | PET |
| 6672 | 2ml | 13x75 | Glass |
| 6673 | 3ml | 13x75 | Glass |
| 6674 | 4ml | 13x100 | Glass |
| 6675 | 5ml | 13x100 | Glass |

Specification: Sodium Fluoride
Potassium Oxalate

Cap Colour: Gray

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6270 | 3ml | 13x75 | PET |
| 6272 | 4ml | 13x75 | PET |
| 6274 | 5ml | 13x100 | PET |
| 6276 | 6ml | 13x100 | PET |

Specification: Sodium Fluoride/K2 EDTA

Cap Colour: Gray

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6281 | 2ml | 13x75 | PET |
| 6283 | 3ml | 13x75 | PET |
| 6285 | 4ml | 13x100 | PET |
| 6287 | 5ml | 13x100 | PET |


### Tube mixing:

KDL glucose tubes should be mixed correctly (8-10times inversions) and immediately after the blood sample has been taken

### Centrifuging conditions:

≤1300g(RCF) for 10 minutes at 18-25°C

## KDL ESR Tubes

KDL ESR tubes contain a buffered sodium citrate solution with concentration of 3.8%. The mixing ratio is 1 part citrate solution to 4 parts blood. Correct amount of blood collection is critical for correct Erythrocyte Sedimentation Rate analysis.

Specification: 3.8% Sodium Citrate

Cap Colour: Black

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6093 | 2ml | 13x75 | PET/PP |
| 6094 | 3ml | 13x75 | PET/PP |
| 6693 | 2ml | 13x75 | Glass |
| 6694 | 3ml | 13x75 | Glass |
| 6692 | 1.6ml | 8x120 | Glass |
| 6695 | 5ml | 13x100 | Glass |

### Tube mixing:

ESR(Erythrocyte Sedimentation Rate)tubes should be gently inverted 180°in 8-10 times.

## KDL ACD Tubes

KDL ACD tubes are suitable for blood bank research,HLA typing, DNA paternity testing and other research.It can effectively reduce the pre-analysis error of the specimen, improve the test accuracy,provide safety protection forpatients and medical staff,reduce nosocomial infection,The anti-coagulant ACD (Acid Citrate Dextrose) is used for the conservation of erythrocytes.

ACD is available in two solutions, A and B, each with different mixture ratios.

Studies have shown that the DNA preservation effect of ACD solution B is better than that of EDTA and heparin at room temperature.Under the protection of ACD solution, three cycles of freezing and thawing of samples had little effect on DNA.

| Anti coagulant | ACD solution A | ACD solution B |
|---|---|---|
| Citrate | 3.30mg/ml | 1.89mg/ml |
| Citrate acid | 1.20mg/ml | 0.69mg/ml |
| Dextrose | 3.68mg/ml | 2.1mg/ml |
| Potassium Sorbate | 0.03mg/ml | 0.03mg/ml |

The figures represent the final concentration in the blood in each case.


### Specification: ACD Solution A

Cap Colour: Yellow

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6159 | 4ml | 13x100 | PET |
| 6161 | 6ml | 16x100 | PET |
| 6162 | 8ml | 16x100 | PET |

### Specification: ACD Solution B

Cap Colour: Yellow

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6167 | 4ml | 13x100 | PET |
| 6169 | 6ml | 16x100 | PET |
| 6170 | 8ml | 16x100 | PET |

### Tube mixing:

Gently mixed 180 degrees upside down for 8-10 times

### Centrifuging conditions:

≤1300g(RCF) for 10 minutes at 25°C

## KDL Plasma Preparation Tubes

KDL Plasma Preparation tubes are used for the separation of undiluted plasma from whole blood for molecular diagnostic test methods.

### KDL Plasma Preparation tubes can ensure:

- •Infectious samples could be handled safely
- •The user will not be exposed to a blood sample in a test tube
- •Plasma is prepared in closed KDL tubes and can be transported directly without the need for sub-loading and re-labeling from primary to secondary contalners.
- •Plasma quality is maintained, The gel barrier will prevent plasma from contacting with red blood cells to maintain plasma stability.


### Specification: K2 EDTA& Gel

Cap Colour: White

| Ref. | Volume | Size(mm) | Material |
|---|---|---|---|
| 6142 | 3ml | 13x75 | PET |
| 6144 | 4ml | 13x100 | PET |
| 6146 | 5ml | 13x100 | PET |

### The viral load will remain stable for:

- •6 hours - whole blood at room tempertature
- •24 hours - separated plasma at room temperature
- •5 days - separated plasmarefrigerated at 4 °C

### Tube mixing:

Immediately after blood collection,gently reverse blood vessel mixing 5-10 times

### Centrifuging conditions:

1500g(RCF)for 10 minutes at 18-25°C


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